Small Business Innovation Research/Small Business Tech Transfer

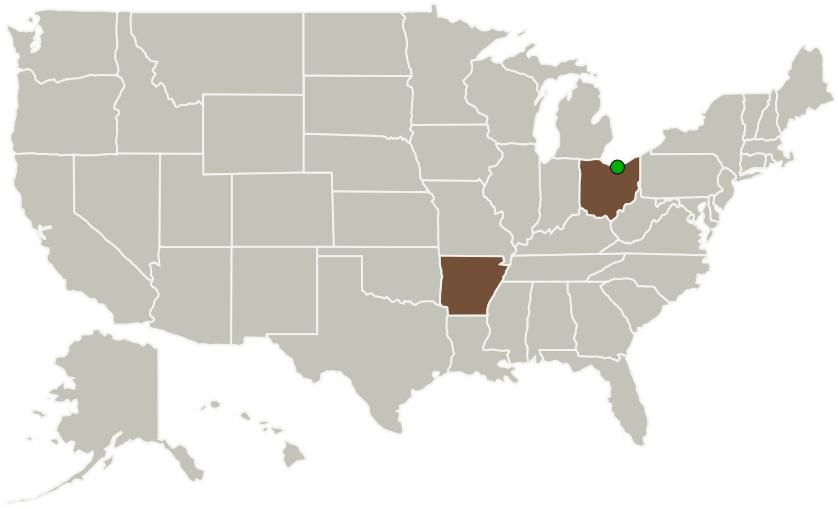
Silicon Carbide (SiC) Power Processing Unit (PPU) for Hall Effect Thrusters, Phase II

Completed Technology Project (2011 - 2013)

Project Introduction

In this SBIR project, APEI, Inc. is proposing to develop a high efficiency, rad-hard 3.8 kW silicon carbide (SiC) power supply for the Power Processing Unit (PPU) of Hall Effect thrusters. This program specifically targets the design of a PPU for the HiVHAC (High Voltage Hall ACcelerator) thruster, with target specifications of 80-160V input, 200-700V / 5A output, efficiency greater than 96%, and peak power density in excess of 2.5 kW/kg. The PPU under development utilizes SiC JFET power switches; components which APEI, Inc. has irradiated under TID conditions to greater than 3 MRad with little to zero change in device performance.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Arkansas Power Electronics International, Inc.	Lead Organization	Industry	Fayetteville, Arkansas
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

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Primary U.S. Work Locations	
Arkansas	Ohio

Project Transitions

June 2011: Project Start

August 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139330)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Arkansas Power Electronics International, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

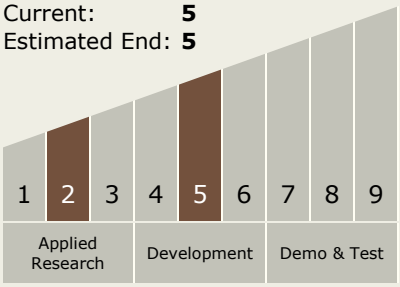
Carlos Torrez

Principal Investigator:

Bradley Reese

Technology Maturity (TRL)

Start: **2**
Current: **5**
Estimated End: **5**



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Completed Technology Project (2011 - 2013)

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.2 Electric Space Propulsion
    - TX01.2.2 Electrostatic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System